

**§ 86.1313-91 Fuel specifications.**

(a) *Otto-cycle test fuel.* (1) Gasoline having the specifications listed in table N91-1 will be used by the Administrator in exhaust emission testing petroleum-fueled substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer in exhaust emission testing, except that the octane specification does not apply.

TABLE N91-1

Item		ASTM	Value
Octane, re-search, min.	.....	D2699 ..	93
Sensitivity, min	.....	.....	7.5
Lead (organic)	g/U.S. gal. (g/liter).	D3237 ..	<sup>1</sup> (0.050) <sup>1</sup> (0.013)
Distillation range:			
IBP .....	°F .....	D86 .....	75-95
	(°C) .....	.....	(23.9-35)
10 pct. point	°F .....	D86 .....	120-135
	(°C) .....	.....	(48.9-57.2)
50 pct. point	°F .....	D86 .....	200-230
	(°C) .....	.....	(93.3-110)
90 pct. point	°F .....	D86 .....	300-325
	(°C) .....	.....	(148.9-162.8)
EP .....	max. °F, .....	D86 .....	415
	(°C) .....	.....	(212.8)
Sulphur .....	max. wt. pct. ...	D1266 ..	0.10
Phosphorus, max..	g/U.S. gal. (g/liter).	D3231 ..	0.005
	.....	.....	(0.0013)
RVP .....	psi, (kPa) .....	D323 .....	8.0-9.2
	.....	.....	(60.0-63.4)
Hydrocarbon composition:			
Olefins .....	max. pct. ....	D1319 ..	10
Aromatics ....	max. pct. ....	D1319 ..	35
Saturates ....	.....	D1319 ..	( <sup>2</sup> )

<sup>1</sup> Maximum.

<sup>2</sup> Remainder.

(2) Unleaded gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in service accumulation.

(i) The octane rating of the gasoline used shall be not higher than one Research octane number above the minimum recommended by the manufacturer and have a minimum sensitivity of 7.5 octane numbers, where sensitivity is defined as the Research octane number minus the Motor octane number.

(ii) The Reid Vapor Pressure of the gasoline used shall be characteristic of the motor fuel used during the season in which the service accumulation takes place.

(3) Methanol fuel used for exhaust and evaporative emission testing and

in service accumulation of methanol-fueled Otto-cycle engines shall be representative of commercially available methanol fuel and shall consist of at least 50 percent methanol by volume.

(i) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation in accordance with paragraph (a)(3) of this section.

(ii) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(4) Other methanol fuels may be used for testing and service accumulation provided:

(i) They are commercially available, and

(ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and

(iii) Use of a fuel listed under paragraph (a)(3) of this section would have a detrimental effect on emissions or durability, and

(iv) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(5) The specification range of the fuels to be used under paragraphs (a)(2), (a)(3), and (a)(4) of this section shall be reported in accordance with § 86.090-21(b)(3).

(b) *Diesel Test fuel.* (1) The petroleum fuels for testing diesel engines employed for testing shall be clean and bright, with pour and cloud points adequate for operability. The petroleum fuel may contain nonmetallic additives as follows: Cetane improver, metal deactivator, antioxidant, dehazer, anti-rust, pour depressant, dye, dispersant, and biocide. Except for the sulfur content of "Type 2-D" fuel, fuels specified for emissions testing are intended to be representative of commercially available in-use fuels.

(2) Petroleum fuel for diesel engines meeting the specifications in Table N91-2, or substantially equivalent specifications approved by the Administrator, shall be used in exhaust emissions testing. The grade of petroleum fuel used shall be commercially designated as "Type 2-D" grade diesel fuel except that fuel commercially designated as "Type 1-D" grade diesel fuel

may be substituted provided that the manufacturer has submitted evidence to the Administrator demonstrating to the Administrator's satisfaction that this fuel will be the predominant in-use fuel. Such evidence could include such

things as copies of signed contracts from customers indicating the intent to purchase and use "Type 1-D" grade diesel fuel as the primary fuel for use in the engines or other evidence acceptable to the Administrator.

TABLE N91-2

Item	ASTM	Type 1-D	Type 2-D
Cetane Number .....	D613	48-54	42-50
Cetane Index .....	D86	40-54	40-48
Distillation range:			
IBP °F .....	D86	330-390	340-400
(°C) .....		(165.6-198.9)	(171.1-204.4)
10 percent point, °F .....	D86	370-430	400-460
(°C) .....		(187.8-221.1)	(204.4-237.8)
50 percent point, °F .....	D86	410-480	470-540
(°C) .....		(210-248.9)	(243.3-282.2)
90 percent point, °F .....	D86	460-520	560-630
(°C) .....		(237.8-271.1)	(293.3-332.2)
EP, °F .....	D86	500-560	610-690
(°C) .....		(260.0-293.3)	(321.1-365.6)
Gravity, °API .....	D287	40-44	32-37
Total Sulfur, percent .....	D2622	0.08-0.12	0.08-0.12
Hydrocarbon composition:			
Aromatics, pct .....	D1319 or D5186	<sup>1</sup> 8	<sup>1</sup> 27
Paraffins, Naphthenes, Olefins .....	D1319	( <sup>2</sup> )	( <sup>2</sup> )
Flashpoint, °F .....	D93	120	130
(°C) .....		(48.9)	(54.4)
(minimum) .....			
Viscosity, Centistokes .....	D445	1.6-2.0	2.0-3.2

<sup>1</sup> Minimum.

<sup>2</sup> Remainder.

(3) Petroleum fuel for diesel engines meeting the specifications in table N91-3, or substantially equivalent specifications approved by the Administrator, shall be used in service accumulation. The grade of petroleum fuel used shall be commercially designated as "Type 2-D" grade diesel fuel except that fuel commercially designated as "Type 1-D" grade diesel fuel may be substituted provided that the manufac-

turer has submitted evidence to the Administrator demonstrating to the Administrator's satisfaction that this fuel will be the predominant in-use fuel. Such evidence could include such things as copies of signed contracts from customers indicating the intent to purchase and use "Type 1-D" grade diesel fuel as the primary fuel for use in the engines or other evidence acceptable to the Administrator.

TABLE N91-3

Item	ASTM	Type 1-D	Type 2-D
Cetane Number .....	D613	42-56	30-58
Distillation range:			
90 pct. point, °F .....	D86	440-530	540-630
(°C) .....		(226.7-276.7)	(282.2-332.2)
Gravity, °API .....	D287	39-45	30-42
Total sulfur, pct .....	D2622	0.08-0.12	0.08-0.12
Flashpoint, min., °F .....	D93	120	130
(°C) .....		(48.9)	(54.4)
Viscosity, centistokes .....	D455	1.2-2.2	1.5-4.5

(4) Methanol fuel used for exhaust and evaporative emission testing and in service accumulation of methanol-fueled diesel engines shall be represent-

ative of commercially available methanol fuel and shall consist of at least 50 percent methanol by volume.

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(i) Manufacturers shall recommend the methanol fuel to be used for testing and service accumulation in accordance with paragraph (b)(4) of this section.

(ii) The Administrator shall determine the methanol fuel to be used for testing and service accumulation.

(5) Other fuels may be used for testing and service accumulation provided:

(i) They are commercially available, and

(ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and

(iii) Use of a fuel listed under paragraphs (b)(2) and (b)(3) or (b)(4) of this section would have a detrimental effect on emissions or durability, and

(iv) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(6) The specification range of the fuels to be used under paragraphs (b)(2), (b)(3), (b)(4), and (b)(5) of this section shall be reported in accordance with § 86.090–21(b)(3).

(c) Fuels not meeting the specifications set forth in this section may be used only with the advance approval of the Administrator.

(d) *Mixtures of petroleum and methanol fuels for flexible fuel vehicles.* (1) Mixtures of petroleum and methanol fuels used for exhaust and evaporative emission testing and service accumulation for flexible fuel vehicles shall be within the range of fuel mixtures for which the vehicle was designed.

(2) Manufacturer testing and service accumulation may be performed using only those mixtures (mixtures may be different for exhaust testing, evaporative testing, and service accumulation) expected to result in the highest emissions, provided:

(i) The fuels which constitute the mixture will be used in customer service, and

(ii) Information, acceptable to the Administrator, is provided by the manufacturer to show that the designated fuel mixtures would result in the highest emissions, and

(iii) Written approval from the Administrator of the fuel specifications

must be provided prior to the start of testing.

(3) The specification range of the fuels to be used under paragraph (d)(2) of this section shall be reported in accordance with § 86.090–21(b)(3).

[55 FR 34147, Aug. 21, 1990, as amended at 58 FR 21401, Apr. 21, 1993; 62 FR 47125, Sept. 5, 1997]

### § 86.1313–94 Fuel specifications.

(a) *Gasoline fuel.* (1) Gasoline having the specifications listed in table N94–1 will be used by the Administrator in exhaust emission testing. Gasoline having these specifications or substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer in exhaust emission testing, except that the octane specification does not apply.

TABLE N94–1

Item	ASTM	Value
Octane, research, min .....	D2699	93
Sensitivity, min .....		7.5
Lead (organic), g/U.S. gal. (g/liter) .....	D3237	<sup>1</sup> (0.050) <sup>1</sup> (0.013)
Distillation range:		
IBP, °F ( °C) .....	D86	75–95 (23.9–35)
10 pct. point, °F ( °C) .....	D86	120–135 (48.9–57.2)
50 pct. point, °F ( °C) .....	D86	200–230 (93.3–110)
90 pct. point, °F ( °C) .....	D86	300–325 (148.9–162.8)
EP, max. °F ( °C) .....	D86	415 (212.8)
Sulphur, Max., wt. pct .....	D1266	0.10
Phosphorus, max., g/U.S. gal. (g/liter) .....	D3231	0.005 (0.0013)
RVP, psi (kPa) .....	D323	8.0–9.2 (60.0–63.4)
Hydrocarbon composition:		
Olefins, max. pct .....	D1319	10
Aromatics, max. pct .....	D1319	35
Saturates .....	D1319	( <sup>2</sup> )

<sup>1</sup> Maximum.

<sup>2</sup> Remainder.

(2)(i) Unleaded gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in service accumulation.

(ii) The octane rating of the gasoline used shall not be higher than one Research octane number above the minimum recommended by the manufacturer and have a minimum sensitivity